





# Imperial Agricultural Bureaux Fourth Annual Report

OF THE  
Executive Council

1932-1933

*Crown Copyright Reserved*

LONDON: 1934

PUBLISHED BY HIS MAJESTY'S STATIONERY OFFICE

ordered directly from H.M. STATIONERY OFFICE at the following addresses:  
Imperial House, Kingsway, London, W.C.2; 120, George Street, Edinburgh 2;  
York Street, Manchester 1; 1, St. Andrew's Crescent, Cardiff;  
80, Chichester Street, Belfast;  
or through any Bookseller.

Price 1s. 0d. Net.

C.)  
3, N29  
3  
16

# IMPERIAL AGRICULTURAL BUREAUX

## EXECUTIVE COUNCIL

<i>Member</i>	<i>Representing</i>
SIR CHARLES J. HOWELL THOMAS K.C.B., K.C.M.G. (Chairman)	United Kingdom
NEVILL L. WRIGHT, F.I.C. (Vice-Chairman)	New Zealand
LT.-COLONEL GEORGE P. VANIER, D.S.O., M.C.	Canada
F. L. McDougall, C.M.G.	Australia
G. W. KIERCK	South Africa
J. M. ADAMS, F.R.S.C.(I.)	Irish Free State
SIR BHUPENDRA NATH MITRA K.C.S.I., K.C.I.E., C.B.E. High Commissioner	India
B. F. WRIGHT	Southern Rhodesia
R. V. VERNON, C.B.	Colonies, Protectorates and Mandated Territories

SIR DAVID CHADWICK, C.S.I., C.I.E. (Secretary)

2 Queen Anne's Gate Buildings

Dartmouth Street

LONDON, S.W.1

# Imperial Agricultural Bureaux

## Fourth Annual Report

OF THE

## Executive Council

1932-1933

*Crown Copyright Reserved*



LONDON, 1934

PUBLISHED BY HIS MAJESTY'S STATIONERY OFFICE

To be purchased directly from H.M. STATIONERY OFFICE at the following addresses  
Adastral House, Kingsway, London, W.C.2 ; 120, George Street, Edinburgh 2  
York Street, Manchester 1 ; 1, St. Andrew's Crescent, Cardiff  
80, Chichester Street, Belfast  
or through any Bookseller

## PREFACE

Many delegates to the Imperial Agricultural Research Conference, 1927, especially those from Overseas, stressed the difficulties they had experienced in obtaining information in different countries of research in various branches of agricultural science and in getting in touch with research workers in other countries. The Conference felt that these common difficulties should be met by a common effort.

2. It accordingly recommended that eight bureaux be established to collect, collate and disseminate information on research in selected branches of agricultural science, and generally to assist research workers in the Empire with information on their subject and with introductions to other research workers. Each bureau was to deal with one of the following branches of agricultural science and be located at an Institute already well known for research in its branch.

Soil Science.	Plant Genetics (other than Herbage).
Animal Health.	Plant Genetics (Herbage).
Animal Nutrition.	Fruit Production.
Animal Genetics.	Agricultural Parasitology.

The cost was to be met from a common fund formed by contributions from Empire Governments.

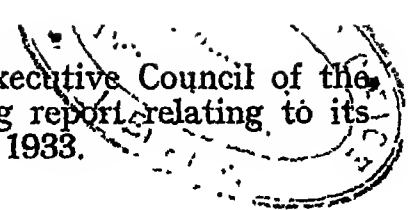
3. These proposals were accepted and a scheme for the finance and administration of the bureaux was prepared at a representative meeting held in London in November, 1928. The acceptance by governments of this scheme, set out in Appendix I, brought into being a new type of Imperial organisation. Since 1st April, 1929, a service of common Empire interest has been maintained from a fund jointly subscribed by the Governments of the Empire and administered by an Executive Council composed of representatives directly appointed by the governments for that purpose.

4. By locating the bureaux at selected research institutes the officers are in daily touch with men engaged in research in their own subject and profit by the guidance and assistance of the Heads of those Institutes. The organisation controlling each of the selected Institutes has allowed the Head of that Institute to act as Director of the Bureau. Each bureau thereby receives the help which only men of wide experience and scientific distinction can give. Other officers of the bureaux are whole-time servants of the Council.

5. In addition, each bureau has in each country of the Empire an official correspondent, who is "the general friend" of that bureau in that country. These official correspondents are appointed by the different governments of the Empire for their interest in the particular branch of science with which a bureau deals. (22)

## REPORT

At its meeting on the 7th March, 1934, the Executive Council of the Imperial Agricultural Bureaux adopted the following report relating to its fourth year's work—1st April, 1932, to 31st March, 1933.



## I.—THE OTTAWA CONFERENCE

Among the subjects for review at the Imperial Conference at Ottawa was a group of questions concerning methods of economic co-operation within the Empire. Like other agencies engaged in intra-Imperial activities, the Council had prepared for the information of the Conference a report on its Constitution and Work. After reviewing the reports submitted by these several organisations, the Conference decided that—

“ a committee should be appointed forthwith, consisting of not more than two representatives of each of the participating Governments, to consider the means of facilitating economic consultation and co-operation between the several Governments of the Commonwealth, including a survey of the functions, organisation and financial bases of the agencies specified in the annexed report, and an examination of what alterations or modifications, if any, in the existing machinery for such co-operation within the Commonwealth are desirable.”

The Executive Council of the Imperial Agricultural Bureaux was one of the “ agencies specified in the annexed report.”

2. This Committee, which was convened by the Government of Canada, met in London on the 14th February, 1933. The Council submitted documentary evidence to it, and, in addition, three members of Council, the Secretary and the Directors of two of the Bureaux were examined orally. The report of this Committee was published in June, 1933. The effect on Council of its recommendations will therefore be dealt with in the Council's annual report for 1933–34. One extract from the report of the Committee is, however, germane to the present report.

“ There is general agreement that the form of administrative and financial control over these bureaux by the Executive Council and its composition are satisfactory for the discharge of the duties entrusted to it. On grounds of convenience and efficiency no change is recommended. At the same time, there is from the constitutional point of view a technical flaw in its composition, which unless remedied might prejudice its acceptance as a model for other inter-Imperial organisations.” (See para. 258 of the report of the Imperial Committee on Economic Consultation and Co-operation.)

This Imperial Committee of investigation thus endorsed the organisation, finance and work of the Council, and advised the continuance of the Council on its present financial basis. It went further. It recommended that certain additional duties should be placed on Council. It also recommended that the technical flaw, referred to above, should be remedied.

In due course all governments notified their acceptance of these recommendations ; and His Majesty's Government in the United Kingdom nominated Sir Charles J. Howell Thomas as its sole representative. The names of Sir Robert Greig and Dr. Scott Robertson do not, therefore, appear among the members of Council given in this report, though they took a full share in the work of the year to which it relates. The Council, whilst appreciating the constitutional reason for the change, desires to recognise the great assistance always rendered by these two colleagues.

## II.—PERSONNEL

3. On his retirement from government service, Dr. J. H. Grisdale retired from Council. The Government of Canada appointed in his place, Dr. G. S. H. Barton, his successor in the office of Deputy Minister of Agriculture, Canada. Dr. Grisdale had taken a very active part in starting the bureaux and in working out their system of control, finance, location and organisation—all of which, as has just been shown, have received this year the commendation of the investigating committee. The Council has lost in Dr. Grisdale a valued and interested colleague.

The Government of Canada has appointed Lt.-Colonel G. P. Vanier, D.S.O., M.C., to be its representative on Council at all meetings which Dr. Barton is unable to attend.

4. Among the senior staff at the bureaux a change was effected in the organisation of the Bureau of Agricultural Parasitology, whereby two senior officers are now directly associated with the bureau instead of one Deputy Director. Part of the work of that bureau is done at St. Albans and part at the London School of Hygiene and Tropical Medicine in London. It was desirable that at each centre there should be a fully trained scientific officer familiar with and connected with the bureau work. Professor Leiper was able to arrange this at very slight additional expense.

## III.—FINANCE

5. The audited statement of receipts and payments for the year is attached to this report. As is customary, the figures there shown are net, after deducting from the expenses of each bureau receipts received by it from sales of publications.

6. The item "sales of investments" represents United Kingdom Treasury Bonds called for repayment and the sale of some Government of India Bonds

which seemed likely to be called (and, in fact, have been) in the near future. The receipts on revenue account in the year amounted to £20,285 13s. 3d., of which £19,745 represented contributions from Governments, as against £19,870 expected.

### *Expenditure*

7. The gross expenditure in the year was £19,245 16s. 8d. The difference, viz., £1,079 13s. 6d. between this and the net expenditure represents the receipts from sales of publications and journals.

8. The analysis of expenditure in the year was as follows :

—	Gross.	Receipts from Sales.	Net.	Percentage of Gross.
	£	£	£	
AT HEADQUARTERS—				
General Administration—Salaries, travelling, stationery, postage, rent, accountants' and auditors' fees, etc. ...	556	—	556	2·9
Printing—List of Agricultural Research Workers, Annual Report and Report for Ottawa Conference ... ..	144	15	129	0·7
AT BUREAUX—				
Salaries, whole time and part time, and fees to translators, abstractors, etc. ...	13,206	—	13,206	68·6
Printing of journals and publications ...	2,382	1,065	1,317	12·5
Stationery and postage ... ..	885	—	885	4·6
Purchase of books and periodicals ... ..	750	—	750	3·9
Rent, rates, light, heat, insurance, water, cleaning ... ..	618	—	618	3·2
Travelling ... ..	367	—	367	1·9
Equipment—Filing cabinets, furniture, etc....	273	—	273	1·4
Contingencies ... ..	65	—	65	0·3
TOTALS ... ..	19,246	1,080	18,166	100·0

Overhead charges have been kept at a low figure. The total cost at headquarters was less than 3 per cent. of the gross expenditure, and overheads at all the eight bureaux only exceeded 3 per cent. by a small fraction. Ninety per cent. of the gross expenditure was incurred in the examination, abstraction and distribution of scientific information, and in the purchase of necessary scientific books and periodicals.

9. The chief increases in expenditure were in salaries and printing. Both of these were to be expected. It has been pointed out in previous reports that through the growth of work and the operation of incremental



scales an increase in expenditure on salaries must be expected, although the reductions introduced with effect from 1st November, 1931, continued to operate during the year. The increase in printing charges is mainly due to the increase in the number of pages of several of the abstracting journals owing to the regular receipt and examination of a larger number of scientific publications and to the increasing number of contacts which the bureaux are making. The bureaux are, in fact, becoming increasingly recognised as the centres of information for their subjects.

### *Receipts*

10. It was possible in the report for the previous year (1931-32) to draw attention to a large increase in the receipts from sales of publications and journals, viz., from £126 to £989. This rapid increase was due to the increased charge (from £1 to £2) made for the Veterinary Bulletin and to the establishment of new journals by other bureaux. It was further stated in that report that in future such rapid increases should not be expected. Receipts from sales increased in the year under review to £1,080, of which the bulk (£735) was again supplied by the Veterinary Bulletin. The journals issued by the bureaux at Cambridge, Aberystwyth, East Malling and Edinburgh had during the year expanded considerably in size. The Council therefore directed that the annual subscriptions should be increased in each case from five to fifteen shillings to take effect with the first number of the subsequent volume in each case. This direction, therefore, produced only little additional revenue in 1932-33.

11. The arrangements made by Council with the Medical Research Council and the Trustees of the Reid Library to establish and issue from the Bureau of Animal Nutrition at Aberdeen an abstracting journal (Nutrition—Abstracts and Reviews) dealing comprehensively with literature on research in nutrition were fully explained in the third annual report of Council. The foregoing figures of expenditure include the £400 subscribed by Council under that arrangement, but the figures of receipts do not include the receipts from sales of this journal which under the arrangement are at the disposal of the Committee of Management for the purposes of the journal. In 1932-33 those receipts amounted to £879, as compared with £632 in the previous year.

12. Notwithstanding the continuance throughout 1932-33 of severe and general economic depression, the sales of every one of the journals issued by the bureaux show some increase. Council feel justified in regarding this fact as recognition of their quality and utility.

## IV.—THE YEAR'S WORK

13. Partly on grounds of economy and partly because the working of the bureaux was under examination by an Imperial Committee, no officer

was sent, during the year, on a visit to an overseas part of the Empire. Mr. Akenhead—fruit production—was, however, deputed to attend the International Horticultural Congress in Paris and later to visit Italy in order to develop contacts and relations with research workers on fruit on the Continent.

The usual annual gathering of soil workers of the Empire was held at Rothamsted in June. It was well attended.

14. Besides the abstract journals, the bureaux continued to issue, from time to time, occasional papers or technical communications on particular subjects. For instance, there may at times be a review of the work on a particular subject in a particular country, but for the most part they take the form of reviews of present knowledge on scientific problems of immediate importance with full and up-to-date bibliographies. They are prepared either by officers of the bureaux, or very frequently, by research workers chosen for their knowledge of the particular subject, in which case the bureau supplies the compiler with copies and translations of articles, abstracts, etc., relevant to his subject. An index is of great value to the specialist. Abstracts are of great value to the specialist and also to more general workers. But the mass of information which is being issued in the world is so great that a good review pamphlet based on a full and up-to-date bibliography and reviewing existing knowledge on a particular subject has a special value. It brings together existing knowledge on a subject in a manner which cannot fail to be helpful and stimulating to all concerned therewith. The bureaux should be in a position to do more of these in the future than in the past, as their records of classified information extend. A list of these and other publications of the bureaux is given in Appendix II; merely a few of the more notable ones issued during the year are mentioned here.

The dispersion of soils in mechanical analysis.

Land amelioration in Germany.

Nutrition in relation to reproduction with special reference to sterility in farm animals.

Vernalization or Lyssenko's method for the pre-treatment of seed.

Investigations on the standardisation of citrus trees by propagation method.

The physiological and genetical aspects of sterility in domesticated animals.

The bursate lungworms of domesticated animals.

Recent researches on helminth immunity.

15. The first of these (The Dispersion of Soils in Mechanical Analysis) in the foregoing list possesses special interest. The different methods used by soil chemists in different countries for the mechanical analysis of soils has long caused difficulty in understanding and correlating results. After much investigation, the International Society of Soil Science some years ago

devised what is known as the "International Method" and hoped that it would be widely adopted by soil analysts in all countries. It has been. But analysts in several Empire countries experienced great difficulties in applying it to some of the soils they encountered. In the early days of the Soil Bureau requests came from several Empire countries for a further examination of these methods, especially in regard to soils of particular types. The bureaux do not undertake actual research. The Soil Bureau, however, was able to arrange for an examination, by Professor Robinson of Bangor University, of the methods for analysing these recalcitrant soils. Professor Robinson had taken a leading part in working out the "International Method." Under his supervision, 79 different types of soils from 25 countries were examined (many of them collected through the bureau) and Professor Robinson's results and suggestions are embodied in this Technical Communication—The Dispersion of Soils in Mechanical Analysis. As the bureau stated in the introduction to the paper:—

*"Comparability of analytical results is a first essential to securing that co-operation in imperial research which it is the Bureau's aim to foster. We hope that research workers throughout the Empire will as far as possible adopt Professor Robinson's recommendations as a first step towards a greater degree of uniformity in all analytical procedure. The recommendations should not be considered as necessarily final, and any criticisms of them, or reports of difficulties encountered in carrying them out will be welcomed."*

The cost of this work was met by the Empire Marketing Board. The Council is indebted to the Board for rendering possible a piece of research which is of interest to all Empire countries, but does not fall within the functions of any one of them.

16. Although the regular and systematic collection, sifting and dissemination of published information is the first function of a bureau, it has opportunities for other forms of service by the mere fact of its being such a centre. The case described in the preceding paragraph is only one instance. Another, of a different type, occurred during the year at the Herbage Bureau at Aberystwyth. At the instance of a well-known lucerne breeder the bureau was able to arrange that the geographical types of lucerne should be tested on an agreed and standard plan under a great variety of climatic and ecological conditions. The bureau received the seed material from France, Canada, Hungary and Russia, and research workers in Canada, South Africa, Wales, Australia, New Zealand, Southern Rhodesia, Nigeria, Germany, Hungary, Sweden, Italy, Turkey and Russia are trying them out, adopting the same plot and recording technique. This case is quoted not from any point of its scientific importance, but as an illustration of the type of the co-operative interest between scattered research workers which results inevitably from the establishment of a recognised centre for the collection and dissemination of information on their subject.

17. Another illustration of the purposes which bureaux can serve occurred at Weybridge. The Agricultural Research Council in the United Kingdom was planning co-ordinated research in the institutes in its own country into a number of important livestock diseases. As a preliminary to such attack it required complete bibliographies and reviews of all work, both Empire and foreign, done on those diseases. It applied to the bureau, mentioning six important diseases on which it wanted full bibliographies. Such a task, urgently undertaken, would have disorganised the regular work of the bureau. Arrangements were soon made, however, whereby with a small addition to the staff (for which the United Kingdom Government paid), the bureau undertook to supply the bibliographies, references and many abstracts and translations to scientists selected by the specialist Committees of the Agricultural Research Council to review and write up the material so collected.

18. Shortly after the Bureau of Animal Health at Weybridge was started, some of the larger veterinary research institutes in the Empire expressed a desire to receive copies of all the titles of articles and papers indexed at the bureau. Each institute which received such a copy would then have available in its library an index of all current papers, etc., on veterinary research and in addition would be able to specify exactly any paper of which it wished the bureau to supply a copy, translation or summary.

Clearly such records would be most used in central institutes and to the libraries at such institutes would be valuable additions. The circulation was thus likely to be limited and the cost of duplication heavy. For two years the Council and bureau examined the question in correspondence with research institutes throughout the Empire and in some foreign countries. Estimates of cost of various forms of duplication were examined. By 1932-33 sufficient subscriptions, at the rate of £4 a year, had been promised to justify the duplication and supply of copies of the bureau index. The Council accordingly sanctioned the issue with effect from April, 1933, of the Index Veterinarius to appear quarterly. A full year's volume will contain over 10,000 titles, which with cross references under subjects and authors may bring the entries from 40,000 to 50,000. The Index Medicus is well known in the medical world; but no work comparable with Index Veterinarius has been hitherto attempted in veterinary science. It has been produced to meet a demand and clearly this special work can only be continued so long as subscriptions adequately cover costs.

19. The abstracting journals are the chief day to day occupation of the bureaux. It was mentioned earlier in this report that several of them had been substantially enlarged due to the increase in the material made available. This was especially the case with those issued from the Plant Genetics Bureau at Cambridge and the Herbage Bureau at Aberystwyth. The same applied to some extent to Horticultural Abstracts issued by the

Fruit Production Bureau at East Malling ; but there also the scope of the publication was enlarged in reply to requests received, so as to cover market vegetables and flowers. Also during the year the Council considered the journal issued by the Bureau of Animal Genetics at Edinburgh and directed that with effect from April, 1933, it should be converted into an abstracting journal, similar in object and production to those issued by the other bureaux.

20. The bureaux exist to serve research workers in the Empire. They correspond direct with research workers in their own subjects. Whilst their normal work of collecting, sifting, translating, abstracting and disseminating information must continue uninterruptedly, their activities are not restricted to the issue of journals and abstracts. They are anxious to help research workers with introductions, translations, references and reviews to the full extent permitted by the general considerations of finance and organisation.

21. The measure of success with which the institution of the Imperial Agricultural Bureaux has already met is a matter of considerable gratification and the Council desires to record at this stage its deep sense of appreciation of the efforts of all concerned. The interest and active help of the Directors and Official Correspondents, the work of the staff at the Bureaux, and of the Secretary and his staff at Headquarters, have led to these satisfactory results.

#### V.—CHAIRMAN AND VICE-CHAIRMAN

22. With the adoption of this report Mr. F. L. McDougall, C.M.G., completed his two years' term of office as Chairman of Council. Mr. McDougall is one of the original members of Council and his very valuable work on behalf of the bureaux has been recognised by an appreciative entry in the Council minutes.

23. For the ensuing two years the Council has elected Sir Charles J. Howell Thomas, K.C.B., K.C.M.G., as Chairman, and Mr. Nevill L. Wright as Vice-Chairman.

CHARLES J. H. THOMAS,  
*Chairman.*

EXECUTIVE COUNCIL, IMPERIAL AGRICULTURAL BUREAUX  
ACCOUNT OF RECEIPTS AND PAYMENTS FOR THE PERIOD 1ST APRIL, 1932, TO 31ST MARCH, 1933

<i>Receipts</i>				<i>Payments</i>			
	£	s.	d.		£	s.	d.
Balance on 1st April, 1932 ...	1,359	4	8	Working Expenses of the Imperial Bureau of—			
Contributions from the Governments of the Empire ...	19,745	—	—	Soil Science (Rothamsted)...	2,326	9	5
Miscellaneous Receipts ...	540	13	3	Animal Nutrition (Aberdeen)	2,433	8	10
Sale of Investments ...	8,636	1	—	Animal Health (Weybridge)	3,796	16	—
				Animal Genetics (Edinburgh)	1,684	16	10
				Fruit Production (East Malling) ...	2,014	4	8
				Plant Genetics (Herbage) (Aberystwyth) ...	1,984	15	9
				Plant Genetics (Non-Herbage) (Cambridge) ...	1,835	10	10
				Agricultural Parasitology (St. Albans) ...	1,404	17	3
				General Secretarial Expenses	685	3	7
					<u>£18,166</u>	<u>3</u>	<u>2</u>
				Purchase of £2,000 (nominal) 3 per cent. New South Wales Stock ...	1,935	4	—
				Purchase of £2,000 (nominal) 3½ per cent. South Australian Stock ...	1,940	4	—
				Deposit of £7,000 in the Post Office Savings Bank ...	7,000	—	—
				Balance on 31st March, 1933—			
				H.M. Paymaster—			
				General ...	£863	9	9
				In hand ...	358	7	3
					<u>1,221</u>	<u>17</u>	<u>—</u>
				Add Suspense Accounts ...	17	10	9
					<u>1,239</u>	<u>7</u>	<u>9</u>
	<u>£30,280</u>	<u>18</u>	<u>11</u>		<u>£30,280</u>	<u>18</u>	<u>11</u>

*Investments at 31st March, 1933*

£4,000 5 per cent. Conversion Stock, 1944/64, at cost ...	£4,152	16	—
£2,000 3 per cent. New South Wales Stock, 1935, at cost ...	1,935	4	—
£2,000 3½ per cent. South Australian Stock, 1939, at cost ...	1,940	4	—
Post Office Savings Bank ...	7,000	—	—

(Signed) V. H. BOYSE,  
Accountant.

26th June, 1933

(Signed) DAVID CHADWICK,  
Secretary.

I have examined the above Account. I have obtained all the information and explanations that I have required, and I certify, as a result of my audit, that in my opinion the above Account is correct.

(Signed) G. C. UPCOTT,  
Comptroller and Auditor General.

EXCHEQUER AND AUDIT DEPARTMENT,  
25th August, 1933.

## APPENDIX I

## IMPERIAL AGRICULTURAL BUREAUX

*Nothing in these Memoranda affects the Imperial Institutes of Entomology or Mycology which were organised prior to the Imperial Agricultural Research Conference of 1927. These two continue independently in accordance with their earlier organisations.*

The following scheme was agreed at a Conference in London in November, 1928, attended by representatives of H.M. Governments in the United Kingdom, Canada, the Commonwealth of Australia, New Zealand, the Union of South Africa, the Irish Free State, the Government of India and the Colonial Office. It has been adopted by the Governments and by the Governing Bodies of the Institutes mentioned in it.

## THE SCHEME

1. The purpose of Imperial Agricultural Bureaux is to act as effective clearing houses for the interchange of information of value to research workers in agricultural science throughout the various parts of the Empire, and for this purpose they should discharge the following functions :—

## FUNCTIONS OF A BUREAU

## A.—Collection of Information.

2. (i) A bureau should maintain an index of research being carried out in different parts of the Empire and as far as practicable in foreign countries.

(ii) A bureau should begin by collecting, abstracting, and collating information from all sources bearing on the most important problems under investigation in different parts of the Empire ; but care should be taken to avoid the collection of uncorrelated data.

(iii) A bureau should keep itself informed of the general progress of research work within its province in different parts of the Empire.

(iv) A bureau should in appropriate cases summarise available statistics where these are of importance in connection with its work.

## B.—Distribution of Information

(i) A bureau should supply, on request, information within the scope of its work to officials and advisory officers, in all parts of the Empire. Where a bureau is not in possession of such information it should endeavour to put the enquirer in touch with the best source.

(ii) A bureau should supply, where feasible, to research workers in the Empire, on request, information including bibliographies and photostat prints of articles on specific problems.

(iii) A bureau should issue information along such lines as may be deemed desirable by the Executive Council.

## C.—Publication

The general distribution of information (apart from the distribution of information to particular individuals) is part of the duties of a bureau, but the publication of special monographs should only be made with the approval of the Executive Council, and though in many cases it may ultimately be found desirable to establish a journal such publication should not, on account of its permanent cost, be undertaken until the bureau has become fully established and then only on the authorisation of the Executive Council.

## D.—General

A bureau should not undertake any laboratory or field research work involving expense but, in addition to its main function of facilitating the exchange of information, a bureau will be in a position to be of service to research workers in various ways and especially along the following lines :—

(i) By facilitating exchange of workers, especially by supplying information in regard to centres between which exchange would be most profitable.

(ii) By facilitating, through correspondence or otherwise, meetings at the most convenient centres of workers interested in the same problems in different parts of the Empire.

(iii) By facilitating the exchange of experimental material for research purposes between institutions or workers in different parts of the Empire.

(iv) By supplying information on the best centres for post graduate study, the best sources of supply of apparatus or equipment and any other such information of a general character which might be of service to institutions or individual workers.

## FUNDS FOR THE BUREAUX

3. The funds for the bureaux will be provided by contributions from the Governments of the Empire.

## A COMMON FUND

4. These contributions will form a common fund for all the bureaux and no part should be earmarked for the service of a particular bureau.

## THE EXECUTIVE COUNCIL

5. The control of the fund, its distribution among the bureaux and the general supervision of the bureaux will rest with the Executive Council of the Imperial Agricultural Bureaux appointed by the Governments of the Empire on the general lines suggested by the Imperial Agricultural Research Conference of 1927.

6. This Council is charged with administrative duties and should consist of one representative of each of the following territories (if and so long as they contribute to the fund) : England and Wales ; Scotland ; Northern Ireland ; Canada ; the Commonwealth of Australia ; New Zealand ; the Union of South Africa ; the Irish Free State ; Newfoundland ; India ; Southern Rhodesia ; the colonies, protectorates, and mandated territories administered by H.M. Government in the United Kingdom.

## NUMBER AND LOCATION OF BUREAUX

7. Eight bureaux should forthwith be established under the following names and for the present should be attached to the following institutes :—

<i>Names.</i>	<i>Location.</i>
The Imperial Bureau of—	Attached to the—
(1) Soil Science .. ..	Rothamsted Experimental Station, Harpenden, Herts, England.
(2) Animal Nutrition .. ..	Rowett Research Institute, Bucksburn, Aberdeen, Scotland.
(3) Animal Health .. ..	Veterinary Research Laboratory, Weybridge, Surrey, England.
(4) Animal Genetics .. ..	Animal Breeding Research Department, Edinburgh University, King's Buildings, West Mains Road, Edinburgh, Scotland.
(5) Agricultural Parasitology ..	Institute of Agricultural Parasitology, nr. St. Albans, England.
(6) Plant Genetics. For crops other than herbage plants	Plant Breeding Institute, Cambridge University, England.
(7) Plant Genetics. For herbage plants.	Welsh Plant Breeding Station, Aberystwyth, Wales.
(8) Fruit Production .. ..	East Malling Research Station, East Malling, Kent, England.

8. The first three of these, namely, the Imperial Bureaux of Soil Science, Animal Nutrition and Animal Health should for the present be organised on a larger scale than the remaining five.



### DIRECTORS AND DEPUTY DIRECTORS OR CHIEF ASSISTANTS

9. The Head of the Research Institute will be in each case *ex-officio* Director of the Imperial Bureau attached to his Institute and he will be entitled "Director of the Bureau." In each case there should be at least one whole-time officer paid from the Council's funds, who should be the deputy director or chief assistant for bureau work.

### OFFICIAL CORRESPONDENTS

10. Specialists in the appropriate sciences should be nominated as official correspondents by the Governments represented on the Executive Council—one by each Government for each bureau.

11. In each country the representative of the bureau will be the Official correspondent to whom the Director may turn for such help as he may require and from whom he may obtain suggestions regarding the work and activity of the bureau.

12. It is expected that these correspondents will make it their duty to take a lively interest in the functions and work of the bureau and facilitate its activities in the interest of research workers in the Empire as a whole.

13. The periodical meetings of the Imperial Agricultural Research Conference and any special meetings of those engaged in a particular science will afford opportunities for adjustment of differences of view regarding the work to be undertaken by the bureau. In case of necessity, and when such opportunities are not likely to occur for some considerable time, the Director should refer the case to the Executive Council.

### APPOINTMENTS OF STAFF AT THE BUREAUX

14. The staff of the Bureau in receipt of salaries of £300 a year or over will be selected in consultation with the Director and will be appointed by the Council with the prior consent of the Government Department or Governing Body controlling the Research Institute.

15. The staff in receipt of salaries below £300 will be appointed on behalf of the Executive Council by such method as may be acceptable to the governing authority of the Institute.

16. The scales of pay of all staff will be fixed and sanctioned by the Executive Council in consultation with the Governing Bodies of the Institutes and the Ministry of Agriculture for Institutes in England and the Board of Agriculture for Scotland, for those in Scotland.

17. The staff of the Bureau will be under the disciplinary control of the Director of the Station, and the exercise of such control shall be governed by such rules and procedure as may be agreed between the Governing Authority and the Executive Council.

### HONORARIA TO DIRECTORS

18. Bureaux will receive great assistance from the Heads of the Institutes who become Directors of the Bureaux and the work of establishment and supervision will make a considerable call on their time and attention. The executive Council recognise this fact and whilst, from the nature of the case, they are unable to remunerate the Heads of these Institutes directly, they desire that the Governing Authorities of the various Institutes be requested to agree that the Heads of their Institutes receive from the Executive Council honoraria at a flat rate of 100 guineas a year, which may be described as allowances, honoraria, or remuneration for literary work as the Governing Authority of each Institute prefers.

### PROPERTY OF THE BUREAUX

19. Movable property bought from Bureau funds should be brought to inventory and should remain the property of the Bureaux.

## ACCOUNTS AND FINANCIAL MACHINERY

20. The accounts of a bureau are to be kept distinct from those of the Institute to which it is attached.

21. The Executive Council will submit annually to the contributing Governments a statement of receipts and expenditure supported by properly audited accounts. Such statement will cover both the expenditure by the Bureaux and expenditure incurred directly by the Executive Council.

22. The accounting year will be for the period ending 31st March each year.

23. Detailed estimates for expenditure in the forthcoming year should be forwarded by the Director of a Bureau to the Secretary of the Executive Council not later than 1st October of each year. These estimates should be in a form to be settled, but should clearly distinguish between the salaries of the superior staff, those of assistants and clerical staff and miscellaneous charges, with reasons for any anticipated unusual expenditure.

24. The rates of pay of staff, charges for rent or new expenditure exceeding £25 not covered in the estimates should not be varied or incurred without the prior sanction of the Executive Council. Otherwise within the totals of the grant for clerical assistance and of the miscellaneous grant the Director has power to reappropriate between subheads during the course of the year.

25. The Treasury in the United Kingdom will be requested to arrange for the opening of a pay account entirely separate from those of His Majesty's Government in the United Kingdom into which all contributions and from which all payments will be made. They will also be requested to arrange for the audit of all expenditure by the Comptroller and Auditor-General under Section 3 of the Exchequer and Audit Act, 1921, under which provision could be made for the report on the audit to be made only to the Executive Council.

26. Advances would be made each quarter by the Secretariat of the Executive Council to the responsible finance officers at each Institute sufficient to cover the estimated quarter's expenditure. Out of that advance such officers would pay all authorised expenses of the Bureau.

27. Immediately at the close of the quarter the finance officer of the Institute would forward to the Secretary of the Executive Council an account in proper form supported by receipts for all expenditure on salaries, wages, etc., and by vouchers for all miscellaneous expenditure. He would be given credit in the central account in the office of the Executive Council for such amount as examination of those vouchers indicated. His requirements for the next quarter would be stated and a further imprest given to place him in funds for the next quarter.

28. All accounts would be brought together in the office of the Executive Council, and these, together with the direct expenditure by the Council would be audited by the Comptroller and Auditor-General who would make his report to the Executive Council.

## TRAVELLING ALLOWANCES

29. Except in special cases and under special sanction of the Council travelling and subsistence allowances of officers subordinate to the Council will be at the rates appropriate to the Research Institute concerned. Travelling and other allowances of members of the Executive Council will be borne by the Governments appointing them.

## OFFICE ESTABLISHMENT OF THE COUNCIL

30. The Council will appoint and dismiss its own Secretary, who will obtain the approval of the Council for the general conduct of its work.

31. The cost of such secretarial work as also any charges for audit will be a charge on the common fund.

## CONTRIBUTIONS

32. As the fund relies solely on contributions from Governments these should become due on the 1st April for the financial year to which they relate.

33. Payments should be made to the Secretary of the Executive Council for credit of the account of the Council at the Paymaster-General's Office in the United Kingdom.

## BUSINESS OF THE COUNCIL

34. The following must go before the Council for their consideration :—

- (a) detailed estimates of the Bureaux,
- (b) the Auditor-General's reports and the annual report of the Executive Council,
- (c) all proposals for new expenditure,
- (d) all appointments within the Council's cognisance.

35. Between meetings of the Council the Chairman, or (if the Chairman is not available) the Vice-Chairman and any two members of the Council, may deal with urgent business but their action must be reported forthwith to the other members of the Council and must be submitted for confirmation to the next meeting of the Council. Ordinarily, expenditure which will involve commitments beyond the current financial year should be deferred for consideration at a full meeting of Council.

36. The Council will ordinarily meet in November and July : in November for the consideration of the Budget and Estimates and in July for consideration of the report and accounts.

37. The Offices of the Council are situated at 2, Queen Anne's Gate Buildings, London, S.W.1.

38. Sir Robert Greig, M.C., LL.D., is appointed Chairman for a period of two years.

Mr. F. L. McDougall, C.M.G., is appointed Vice-Chairman.

The Chairman, Vice-Chairman and Mr. R. V. Vernon are appointed to a panel each of whom can sign pay orders with the Secretary.

Sir David Chadwick, C.S.I., C.I.E., is appointed Secretary.

Mr. W. R. Black, M.B.E., is appointed liaison officer with the Ministry of Agriculture and Fisheries.

## MISCELLANEOUS

39. Contracts of employment where necessary will run in the names of the Chairman and Secretary for the time being on behalf of the Council.

40. All appointments are for the time being to be temporary.

41. All Governments are requested to communicate to the Secretary of the Council the names of the official correspondents appointed to the different bureaux.

42. In the event of a Member of the Council being unable to attend a meeting the name of a substitute shall be communicated to the Secretary.

DAVID CHADWICK,

*Secretary to the Executive Council.*

## APPENDIX II

## PUBLICATIONS OF THE IMPERIAL AGRICULTURAL BUREAUX

## I. Obtainable from The Imperial Bureau of Soil Science, Rothamsted Experimental Station, Harpenden, Herts.

*Periodical Abstracts.*

	s.	d.
Publications on Soil Science issued from the Empire Overseas during 1929 .. .. .	0	6
" " " " " 1930 .. .. .	1	0
" " " " " 1931 .. .. .	1	0
" " " " " 1932 .. .. .	1	0
List of Publications relating to Soils and Fertilisers—		
Published monthly (Nos. 2, 5, 6, 7, 8, 9, 18 and 20 are out of print), per annum .. ..	10	0
Monthly Letters—Numbers 1-26 (Nos. 2, 3, 4, 6, 8, 10, 11, 12, 13, 16 and 17 are out of print). Free to recipients, within the British Empire, of "Publications relating to Soils and Fertilisers."		
Subscription, outside the Empire, per annum .. ..	4	0
Recent Developments in Soil Analysis—Quarterly Supplement to the above publication. Separate copies, each .. ..	0	6

*Occasional Papers.*

## TECHNICAL COMMUNICATIONS.

5. Soil Erosion .. .. .	1	0
6. The American Method of Soil Classification and Survey (by L. L. Lee) .. .. .	1	0
7. Methods of taking Soil Profiles .. .. .	0	6
10. The Arrangement of Field Experiments and the Statistical Reduction of the Results (by R. A. Fisher and J. Wishart) .. .. .	1	0
11. Note on an Area of Alkali Land in Western Australia .. .. .	0	6
13. The Second International Congress of Soil Science .. .. .	1	0
14. Weights and Measures occurring in Agricultural Publications of the Empire Overseas .. ..	0	6
15. Soil Survey for Irrigation Purposes in South Africa .. .. .	1	0
16. Soil Erosion. Supplementary Note .. .. .	0	6
17. Proceedings of a Conference on Soil Science Problems, September, 1930 .. .. .	1	6
19. Air Survey in relation to Soil Survey (by R. Bourne) .. .. .	1	0
20. Lucerne "Inoculation" and the Factors affecting its Success .. .. .	1	6
21. Summaries of Papers read at the Sixth International Congress of Tropical and Sub-tropical Agriculture, Paris, 1931 .. .. .	0	6
23. The Reclamation of Alkali Land in Hungary (A. A. J. de'Sigmond) .. .. .	1	6
24. Laterite and Laterite Soils .. .. .	2	0
25. The Mitscherlich, Wiessmann and Neubauer Methods of Determining the Nutrient Content of Soils (by R. Stewart) .. .. .	2	0
26. The Dispersion of Soils in Mechanical Analysis .. .. .	2	0
27. Land Amelioration in Germany (by H. Janert) .. .. .	2	0
28. Soil Erosion (by T. Eden) .. .. .	2	0
Annual Report: For the year 1929-30 .. .. .	0	6
" " 1930-31 .. .. .	0	6
" " 1931-32 .. .. .	0	6
" " 1932-33 .. .. .	0	6

## MISCELLANEOUS.

Bibliography on Sisal .. .. .	1	0
Bibliography on Tobacco .. .. .	2	0
Catalogue of Journals and Periodicals in the Library of Rothamsted Experimental Station ..	2	0

## II. Obtainable from The Imperial Bureau of Animal Health, Veterinary Research Laboratory, New Haw, Weybridge, Surrey.

*Abstracting Journal.*

	s.	d.
THE VETERINARY BULLETIN.		
1931. Vol. 1. Quarterly (1st Number, April) .. .. .	7	6
Annual Subscription (back numbers still available) .. .. .	20	0
Subsequent Volumes. Monthly (1st Number, January) .. .. .	5	0
Annual Subscription (postage paid) .. .. .	40	0

*Indexing Publication.*

INDEX VETERINARIUS. Four issues a year. First quarter, 1933. Annual Subscription (postage paid) ..	80	0
--	----	---

III. Obtainable from The Imperial Bureau of Animal Nutrition, Rowett Research Institute, Bucksburn, Aberdeen.

*Journal.*

NUTRITION ABSTRACTS AND REVIEWS. (Issued under the direction of the Imperial Agricultural Bureaux Council, the Medical Research Council and the Reid Library.)

Subscription per Volume of 4 numbers	..	..	..	..	..	..	..	..	..	..	s.	d.
Per single number	..	..	..	..	..	..	..	..	..	..	21	0
											6	6

*Occasional Papers.*

TECHNICAL COMMUNICATIONS.

1. A.I.V. Silage	..	..	..	..	..	..	..	..	..	..	0	6
2. Nutrition in Relation to Reproduction with Special Reference to Sterility in Farm Animals	..	..	..	..	..	..	..	..	..	..	0	6
3. Recent Research on Forage Crop Cultivation, Fodder Conservation and Utilisation, at the Animal Breeding Institute of the University, Königsberg	..	..	..	..	..	..	..	..	..	..	1	0
4. Problems of Animal Nutrition and Animal Husbandry in Northern Nigeria..	..	..	..	..	..	..	..	..	..	..	1	0

OCCASIONAL COMMUNICATIONS.

1. The Effect of Climate on the Composition of Pasture Plants	..	..	..	..	..	..	..	..	..	..	—	
---	----	----	----	----	----	----	----	----	----	----	---	--

IV. Obtainable from The Imperial Bureau of Plant Genetics (for Crops other than Herbage), Plant Breeding Institute, School of Agriculture, Cambridge.

*Journal.*

PLANT BREEDING ABSTRACTS.

Quarterly. Volumes I-III (Nos. 1 and 2 of Vol. I and No. 1 of Vol. II are out of print).	Annual	s.	d.
Subscription	..	5	0
Single copies	..	1	6
Vol. IV, commencing October, 1933, Annual Subscription	..	15	0
Numbers printed on one side of paper	..	16	0

*Occasional Papers.*

Wheat Breeding Bibliography. Part 1	..	..	..	..	..	..	..	..	..	..	1	6
Part 2	..	..	..	..	..	..	..	..	..	..	2	6
Breeding Varieties Resistant to Disease	..	..	..	..	..	..	..	..	..	..	2	0
Barley Breeding Bibliography	..	..	..	..	..	..	..	..	..	..	1	6
Lodging in Cereals	..	..	..	..	..	..	..	..	..	..	0	6
Oat Breeding Bibliography	..	..	..	..	..	..	..	..	..	..	1	6
Rice Breeding Bibliography	..	..	..	..	..	..	..	..	..	..	1	6
Bibliography on Interspecific and Intergeneric Hybridisation in Relation to Plant Breeding	..	..	..	..	..	..	..	..	..	..	2	0
Account of the Research in Progress in the British Empire	..	..	..	..	..	..	..	..	..	..	3	6
Rye Breeding Bibliography	..	..	..	..	..	..	..	..	..	..	1	6
Bibliography on Breeding Sorghums and Millets	..	..	..	..	..	..	..	..	..	..	1	0
Subject Index to Vols. I and II of Plant Breeding Abstracts	..	..	..	..	..	..	..	..	..	..	2	6
Vernalization or Lyssenko's Method for the Pre-treatment of Seed	..	..	..	..	..	..	..	..	..	..	2	6
Experimental Determination of Baking Quality in Wheat	..	..	..	..	..	..	..	..	..	..	2	6
Plant Breeding in the Soviet Union. [Joint Publication of the Imperial Bureaux of Plant Genetics]	..	..	..	..	..	..	..	..	..	..	3	6
Summary of Reports received from Countries exclusive of the British Empire, 1928-31	..	..	..	..	..	..	..	..	..	..	2	6
Breeding Cross Fertilised Plants, with Special Reference to Maize (in preparation)	..	..	..	..	..	..	..	..	..	..	—	

V. Obtainable from The Imperial Bureau of Plant Genetics (Herbage Plants), Welsh Plant Breeding Station, Agricultural Buildings, Alexandra Road, Aberystwyth, Wales.

*Journal.*

HERBAGE ABSTRACTS, Quarterly.

Vol. 1 (1931), Nos. 2 and 3	..	..	..	..	..	..	..	..	..	..	s.	d.
Vol. 2 (1932)	..	..	..	..	..	..	..	..	..	..	3	0
Vol. 3 (1933)	..	..	..	..	..	..	..	..	..	..	5	0
Vol. 4 (1934)	..	..	..	..	..	..	..	..	..	..	15	0
Single numbers	..	..	..	..	..	..	..	..	..	..	15	0
											4	0

HERBAGE REVIEWS, Vol. 1 (1933), Vol. 2 (1934).

Subscription is at present (1934) included in that to Herbage Abstracts.

*Occasional Papers.***BULLETINS.**

	<i>s.</i>	<i>d.</i>
3. The Breeding of Herbage Plants: Technique adopted at the Welsh Plant Breeding Station, June, 1931 .. .. .	3	0
4. Abstract-Review of Lucerne Literature during Period 1925-30. September, 1931 .. .. .	2	6
6. Research on Forage Crops in Soviet Central Asia, with Special Reference to Turkestan Lucerne. March, 1932 .. .. .	1	6
7. Further Contributions on the Technique Employed in the Breeding of Herbage and Forage Plants. May, 1932 .. .. .	2	0
9. Vernalization, or Lyssenko's method for the Pre-treatment of Seed, by R. O. Whyte and P. S. Hudson. March, 1933 .. .. .	2	6
10. Grazing. Papers read at the Meeting of the British Association for the Advancement of Science at Leicester on 11th September, 1933, by P. F. Astill, A. Bridges, W. Davies and M. G. Jones. September, 1933 .. .. .	1	6
11. Technique Employed in Grassland Research in New Zealand. [Foreword by A. H. Cockayne, and contributions by E. Bruce Levy, J. W. Hadfield, A. W. Hudson, J. W. Calder, W. A. Jacques, B. W. Doak and N. R. Foy.] September, 1933 .. .. .	3	0
12. Lucerne: Its Ecological Position and Distribution in the World, by M. Klinkowski. November, 1933 .. .. .	3	6
13. Plant Breeding in the Soviet Union. [Joint Publication of Imperial Bureaux of Plant Genetics.] November, 1933 .. .. .	3	6
14. Grassland Research in Australia. February, 1934 .. .. .	3	0

**VI. Obtainable from The Imperial Bureau of Fruit Production, East Malling Research Station, East Malling, Kent.**

*Journal.*

**HORTICULTURAL ABSTRACTS.** A quarterly abstract publication of current horticultural literature.

	<i>s.</i>	<i>d.</i>
Vol. I. First issued, March, 1931. Nos. 2, 3 and 4, 3s. 6d., or each .. .. .	1	6
Vol. II. Annual Subscription .. .. .	5	0
Single copy .. .. .	1	6
Vols. III and IV. Annual Subscription .. .. .	15	0
Single copy .. .. .	4	0

**TECHNICAL COMMUNICATION.**

1. Ringing of Fruit Trees. 1930. D. Akenhead (Out of print).
2. Field Experiments in Horticulture. 1931. T. N. Hoblyn .. .. . 2 0
3. Investigations on the Standardisation of Citrus Trees by Propagation Methods. 1932 .. .. . 2 0
4. Problems of Fruit Tree Nutrition. Possible Lines of Approach. 1933. T. Wallace .. .. . 2 0

*Occasional Papers.*

1. Technique in Pot Culture for Fruit Plants. 1933. Dr. T. Wallace .. .. . 0 6
  2. Experimental Data on Orchard and Small Fruit Manuring. 1933. S. T. Antoshin .. .. . 1 0
- Contents, Subject and Author Index of Volumes I-X of Journal of Pomology and Horticultural Science (compiled by Bureau, published by Journal of Pomology and Horticultural Science. 1933). .. .. . 5 0

**Proceedings of First Imperial Horticultural Conference, 1930.**

Part II. Papers on the application of Science to Horticulture. 1931. 2s. Out of print, but the following separates are available, each .. .. . 0 3

The Adaptation of Modern Statistical Methods to Horticultural Conditions (T. N. Hoblyn).  
Practicability of the Application of Statistical Method in the Case of Tropical and Sub-tropical Crops (Professor E. E. Cheesman).

Field Experiments in Certain Tropical and Sub-tropical Crops in West Africa (Dr. E. J. Martin and W. H. Beckett).

Fruit Products and Associated Problems (Professor B. T. P. Barker).

Some Physiological Considerations in Horticulture (Professor V. H. Blackman).

Plant Physiological Work in the Tropics: Some of the Problems, with Special Reference to Cocoa and some Possible Lines of Attack (Dr. T. G. Mason and Dr. E. J. Maskell).

Soil and Survey Work as a Basis for Fruit Production in Irrigated Areas (Professor A. J. Prescott).

Part III. Papers on Progress in Fruit Storage Methods, 1931 .. .. . 2 6

The following separates are available, each .. .. . 0 3

A Survey of some of the Principal Fruit Storage and Transport Problems of the Empire to-day (Dr. Franklin Kidd).

Factors Influencing the Storage Qualities of Fruit (Dr. T. Wallace).

- Recent Progress in the Study of Jonathan Breakdown in U.S.A. and Canada (R. C. Palmer).  
 The Present Position of the Bitter Pit Problem in Australia (W. M. Carne, H. A. Pittman and H. G. Elliott).  
 The Behaviour and Diseases of the Banana in Storage and Transport (Dr. C. W. Wardlaw and Dr. L. P. McGuire).  
 Problems of Storage and Transport (E. A. Griffiths).  
 Fruit Transport Problems in Canada (R. L. Wheeler).  
 The Infection and Invasion of the Apple Fruit by Fungi in Relation to the Problem of Storage (Dr. A. S. Horne).

VII. Obtainable from The Imperial Bureau of Animal Genetics, Institute of Animal Genetics, University of Edinburgh, King's Buildings, West Mains Road, Edinburgh.

*Journal.*

Quarterly Bulletin (New Series), Vol. 1, commencing January, 1931 .. .. .	Free
Vol. 2, commencing January, 1932 (now discontinued), per annum	s. d. 5 0
Animal Breeding Abstracts (quarterly), commencing April, 1933, Annual Subscription .. ..	15 0

*Occasional Papers.*

The Genetics of the Horse (in collaboration) .. .. .	0 6
Bibliography on the Biology of the Fleece, 1931 .. .. .	2 6
Bibliography on Fur Breeding, 1931 .. .. .	1 0
Bibliography on the Genetics and Sex Physiology of the Rabbit, 1931 .. .. .	2 6
The Physiological and Genetical Aspects of Sterility in Domesticated Animals (with Bibliography), 1932 .. .. .	2 6
The Inheritance of High Milk Yield (in collaboration) .. .. .	1 0
The Technique of Artificial Insemination, 1933 .. .. .	2 6
Animal Breeding in the British Empire. A Survey of Research and Experiment, 1934 .. ..	1 0

VIII. Obtainable from The Imperial Bureau of Agricultural Parasitology, Institute of Agricultural Parasitology, Winches Farm Drive, Hatfield Road, St. Albans, Herts.

(a) Bibliography of Helminthology. For the year 1930, 62 pp. For the year 1931, 81 pp. .. ..	s. d.
Library Edition, bound in cloth .. .. .	8 6
Stiff paper cover only .. .. .	6 0
Supplement for 1930, 18 pp. .. .. .	1 6
Subject Index to Titles, for 1930, 8 pp.; for 1931, 11 pp.; free on application.	
(b) The Root-infesting Eelworms of the Genus <i>Heterodera</i> . A Bibliography and Host List, viii and 99 pp., 2 plates. .. .. .	
Library Edition, bound in cloth .. .. .	8 6
Stiff paper cover only .. .. .	6 0
(c)*The Helminth Parasites of Common Rats. By J. N. Oldham, 42 pp. .. .. .	2 0
(d)*The Genus <i>Anguillulina</i> Gerv. and v. Ben., 1859, vel. <i>Tylenchus</i> Bastian, 1865. By T. Goodey, 106 pp., 117 figs. .. .. .	6 0
(e) The Bursate Lungworms of Domesticated Animals. By T. W. M. Cameron, 36 pp. .. ..	5 0
(f) The Scope and Aims of the Imperial Bureau of Agricultural Parasitology. By B. G. Peters, 6 pp.; free on application.	
(g) Recent Researches on Helminth Immunity. By Phyllis A. Clapham, 20 pp. .. .. .	3 0

NOTES AND MEMORANDA.

*1. On the Eelworm, <i>Heterodera schachtii</i> , as a Potential Danger to the Sugar-beet Industry in Britain, 8 pp. .. .. .	1 0
*2. Hand-list of the Helminth Parasites of the Rabbit, 12 pp. .. .. .	1 0
*3. The Kidney-worm of Swine: <i>Stephanurus dentatus</i> , 12 pp. .. .. .	1 0
*4. The Helminth Parasites of Deer, 32 pp. .. .. .	2 0
*5. Differential Diagnosis of Plant-parasitic Eelworms, 12 pp. .. .. .	1 0
6. "Potato Sickness" and the Eelworm, <i>Heterodera schachtii</i> , 22 pp. .. .. .	2 0
7. Helminthology in its Application to Livestock. By T. W. M. Cameron, 8 pp. .. ..	1 0
8. Helminthology in its Application to Agriculture and Horticulture. By M. J. Triffitt, 6 pp. ..	1 0
9. Helminths in the Biological Control of Insect Pests. By J. N. Oldham, 6 pp. .. ..	1 0
*10. The Helminth Parasites of Marsupials. By J. N. Oldham, 62 pp. .. .. .	4 0

\* These appeared originally in the *Journal of Helminthology* and are now issued separately in stiff paper covers.

## HELMINTHOLOGICAL ABSTRACTS.

Issued in five parts annually by the *Journal of Helminthology*; incorporates abstracts prepared by the Bureau of original papers on applied helminthology. Subscription, 30s. 0d net a volume, post free.

PUBLICATIONS ISSUED BY THE IMPERIAL INSTITUTE OF ENTOMOLOGY,  
41, QUEEN'S GATE, LONDON, S.W.7.

## BULLETIN OF ENTOMOLOGICAL RESEARCH.

Published quarterly, and containing original articles on Economic Entomology. Issued post free.

	s.	d.
Annual Subscription (payable in advance) .. .. .	30	0
Subscription to current volume received after 30th June .. .. .	36	0
Separate parts .. .. .	9	0
Back volumes—I (1910)-X .. .. .	20	0
XI (1920)-XXIII (1932)* .. .. .	25	0
Bound volumes (extra to above prices) .. .. .	6	0
Binding cases only .. .. .	3	6

\* Volumes XXIV (1933) onwards will be priced at 37s. 6d. as they become back volumes.

## REVIEW OF APPLIED ENTOMOLOGY.

Consisting of abstracts or reviews of all current literature on Economic Entomology throughout the world. Published monthly in two series:—

Series "A" dealing with insect and other Arthropod pests of cultivated plants, forest trees and stored products of animal and vegetable origin.

Series "B" dealing with insects, ticks, etc., conveying disease or otherwise injurious to man and animals. Issued post free.

	Series "A"		Series "B."	
	s.	d.	s.	d.
Annual Subscription (payable in advance) .. .. .	18	0	9	0
Subscription to current volume received after 30th June .. .. .	24	0	12	0
Separate parts .. .. .	2	0	1	0
Annual Subject Index (when sold separately) .. .. .	4	0	2	0
Subject Index—Vol. I-VII .. .. .	5	0	I-X	10 0
Back volumes—Vol. I (1913)-VII .. .. .	15	0		10 0
Vol. VIII (1920) <i>et seq.</i> .. .. .	24	0		12 0
Bound volumes (extra to above prices) .. .. .	5	0		5 0
Binding cases only .. .. .	3	6		3 6

The index to the current volume is not published until April (Series "B") or August (Series "A") of the following year.

## ZOOLOGICAL RECORD—PART INSECTA.

Published annually about July in each year and containing as complete a record as possible of the literature of the previous year, chiefly from the systematic standpoint

	s.	d.
Annual Subscription (including postage) .. .. .	15	6
Back volumes—Vol. LII (1915)-LVII (1920) .. .. .	12	0
Vol. LVIII (1921) <i>et seq.</i> .. .. .	15	0

Postage extra.

## AN ABSTRACT OF THE LEGISLATION IN FORCE IN THE BRITISH EMPIRE DEALING WITH PLANT PESTS AND DISEASES UP TO THE YEAR 1920.

By E. Marguerite Ralfs, B.A. Med. 8vo. 65 pp. Paper covers. Price, 2s. 6d. 1921.

## TSETSE-FLIES. Their Characteristics, Distribution and Bionomics, with some account of possible Methods for their Control.

By Major E. E. Ainslie, D.S.O., and Emile Hegh. Med. 8vo. 188 pp. With 5 plates and 19 figures. Paper covers. Price, 7s. 6d. Postage 4d. extra. 1922.

## LOCUSTS AND GRASSHOPPERS. A Handbook for their Study and Control.

By B. P. Uvarov. Imp. 8vo. Pp. xiii and 352. With 9 plates and 118 text figures. Bound in buckram. Price, 21s. net. Postage, inland 9d.; abroad, 1s. 3d. 1923.



**THE COCONUT MOTH IN FIJI. A History of its Control by means of Parasites.**

By J. D. Tothill, D.Sc., T. H. C. Taylor, B.Sc., and R. W. Paine, B.A. Containing a full account of the successful campaign against this important coconut pest. Imp. 8vo. Pp. vi and 269. With 12 coloured and 22 black-and-white plates, 1 map, and 121 text figures. Bound in buckram. Price, 31s. 6d. net. Postage, inland, 9d.; abroad, 1s. 3d. 1930.

**A LIST OF THE ENTOMOLOGISTS EMPLOYED IN THE BRITISH EMPIRE.**

Prepared for the Third Imperial Entomological Conference, 1930. Med. 8vo. 16 pp. Paper covers. Price, 2s. 6d. 1930.

**A SUMMARY OF DATA RELATING TO ECONOMIC ENTOMOLOGY IN THE BRITISH EMPIRE.**

Prepared for the Third Imperial Entomological Conference, 1930, by S. A. Neave, M.A., D.Sc. Med. 8vo. 24 pp. Paper covers. Price, 2s. 6d. 1930. (At present out of print.)

**REPORT OF THE THIRD IMPERIAL ENTOMOLOGICAL CONFERENCE, 17TH-27TH JUNE, 1930.**

Med. 8vo. 59 pp. Paper covers. Price, 2s. 1930.

Orders may be sent direct to the Assistant Director, Imperial Institute of Entomology, 41, Queen's Gate, London, S.W.7, or through a bookseller.

**PUBLICATIONS OBTAINABLE FROM THE IMPERIAL MYCOLOGICAL INSTITUTE,  
KEW, SURREY.**

*Journal.***REVIEW OF APPLIED MYCOLOGY.**

	s.	d.
Annual Subscription, 12 monthly parts, with title-page and index (post free) .. .. .	21	0
Single part .. .. .	2	0
Title-page and Index .. .. .	3	0
Back volumes (with the exception of Vols. I, VII, and VIII, which are out of print) can be supplied, postage extra.		

*Occasional Publications.***ANNOTATED ACCOUNT OF FUNGI RECEIVED AT THE IMPERIAL MYCOLOGICAL INSTITUTE.**

	s.	d.
List I .. .. .	1	0
List II, Fasc. 1 .. .. .	1	0
List II, Fasc. 2 .. .. .	5	0

Printed under the authority of HIS MAJESTY'S STATIONERY OFFICE  
By HARRISON AND SONS, LTD., 44-47, St. Martin's Lane, London, W.C.2,  
Printers in Ordinary to His Majesty.

(B12/4610)q Wt. P.170-66 2000 5/34 H & S, Ltd. Gp. 12

## ADDRESSES OF THE IMPERIAL AGRICULTURAL BUREAUX

Imperial Bureau of—	Director.	Deputy Director or Chief Officer in direct Charge of Bureau.
<b>Soil Science—</b> Rothamsted Experimental Station, Harpenden, Herts, England.	Sir E. J. Russell, O.B.E., D.Sc., F.R.S.	G. V. Jacks, M.A., B.Sc.
<b>Animal Health—</b> Veterinary Research Laboratory, New Haw, Weybridge, Surrey, England.	W. Horner Andrews, D.Sc., M.R.C.V.S.	W. A. Pool, M.R.C.V.S.
<b>Animal Nutrition—</b> Rowett Research Institute, Bucksburn, Aberdeen, Scotland.	J. B. Orr, D.S.O., M.C., M.A., M.D., D.Sc., F.R.S.	F. C. Kelly, B.Sc., Ph.D., A.I.C.
<b>Plant Genetics (for Crops other than Herbage)—</b> Plant Breeding Institute, School of Agriculture, Cambridge, England.	Sir R. H. Biffen, M.A., F.R.S.	P. S. Hudson, B.Sc., Ph.D.
<b>Plant Genetics (Herbage Plants)—</b> Welsh Plant Breeding Station, Agricultural Buildings, Alexandra Road, Aberystwyth, Wales.	Professor R. G. Stapledon, C.B.E., M.A.	R. O. Whyte, B.Sc., Ph.D.
<b>Fruit Production—</b> East Malling Research Station, East Malling, Kent, England.	Ronald G. Hatton, C.B.E., M.A., V.M.H.	D. Akenhead, M.A., B.Sc.
<b>Animal Genetics—</b> Institute of Animal Genetics, University of Edinburgh, King's Buildings, West Mains Road, Edinburgh, Scotland.	Professor F. A. E. Crew, M.D., D.Sc., Ph.D., F.R.S.E.	—
<b>Agricultural Parasitology—</b> Institute of Agricultural Parasitology, Winches Farm Drive, Hatfield Road, St. Albans, Herts, England.	Professor R. T. Leiper, M.D., D.Sc., F.R.S.	J. N. Oldham, B.Sc., Ph.D. (St. Albans). B. G. Peters, M.Sc., Ph.D. (London Office).